SOP 5.1

TITLE

GENERIC STAGE/INCREMENT TRANSITION COORDINATION

PURPOSE

To identify the generic coordination procedure required by the POIC cadre, IST, and Remote Users during a transition between a stage/increment.

PARTICIPATION

POIC Cadre   IST
Remote Users

EFFECTIVITY

Increment 2 and subsequent

REFERENCE DOCUMENTATION

Joint Operations Interface Procedures (MCC-H 28179), Volume C, Section 6

GENERAL

This procedure provides the basic steps performed by the participants during a reconfiguration of the POIC systems when transitioning between a stage/increment. Proper coordination and status during this period ensures the POIC systems are properly configured and validated during the transition stages. An overview flow, Figure 5.1-1, includes a timeline of events along with references to procedures.

Included is a template for the detailed POIC Transition Timeline Checklist, Figure 5.1-3, with a description of each of the columns. This checklist will be updated for each Stage/ Increment Transition and posted on the RICO Realtime Information web site (http://payloads.msfc.nasa.gov/station/rico/ricowelcome.html). This checklist will be used during the actual transition operations.

POIC POH
VOL 2

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TRANSITION
SECTION 5.0

Present Stage/Increment POIC Systems

Transition (Next) Stage/Increment POIC

(P)

IST Re-configure Primary Systems for next Stage/Inc

(Q) Next Stage/Inc Rack / Subrack Payload Activation

(N) ISS Undocking TBD Hours

Transport Operations

Flight B STS Landing

POIC Cadre Flight A Support Ends

(P) POIC Cadre Supporting Only Flight B

ETOV Transfer Operations Completed

(R)

MCC-H Reconfiguration

ISS Onboard Re-configuration for next Stage/Inc

The order of the stage or increment timeline events dictates the order of payloads deactivation, de-installation, preparation for transfer, transfer, installation, activation, and required ISS reconfigurations. Each stage or increment transition is a unique timeline.

Flight A Payload Powered Payload Deactivation/ Prep for Transfer

Flight B Payload Installation

Powered Payload Transfer Operations

Rack/Unpowered Transfer Operations

Flight A Payload Unpowered/Rack Payload Deactivation/Prep for Transfer

Flight B Payload Rack/Unpowered Payload Installation

(O) Docking

Flight A Payload OPS Completed

Flight A Payload Operations

L – 8 Days
L - 6 Days (A)*
IST Configure and Verify Transition Systems

L – 4 days (B,C,D,E)
POIC Cadre Systems Check

L – 3 days (F,G,H,I)
Remote Users Systems Check

(O) Docking

(N) Transport Operations L to L+72 Hours

L-2 days (K)
ETOV Support Starts L-2 Days

L-1 day (L)
MCC-H Ground Systems Reconfig-uration

(M) Next Stage/ Increment Launch
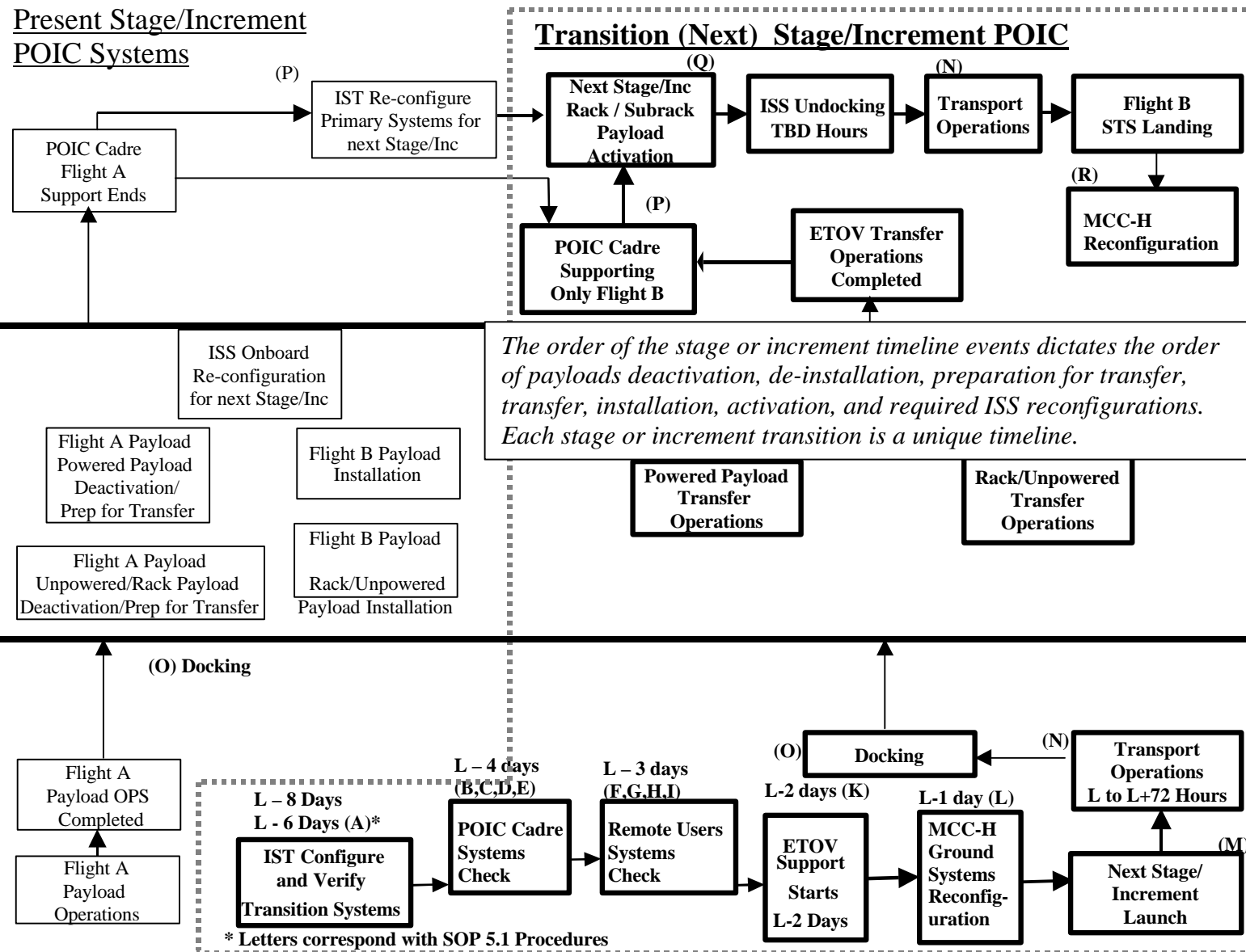
* Letters correspond with SOP 5.1 Procedures

FIGURE 5.1-1 GENERIC STAGE/INCREMENT TRANSITION

Preliminary   **5A.1 to 6A Flight Transition Timeline Checklist**   **Date:03/03/01**

Initial		MET dd:hh:mm	GMT d/hh:mm:ss	Seq.	Position	Activity	5A.1 CADRE PCA-1	6A Trans Team PCA-2	6A Cadre PCA-1	Remote Users
	-	06:00:00	2/11:45:00	1	INFO	L-6 Days				

Column Descriptions:

Initial – initials of the person that performed the activity

- / + "-" Minus denotes prior to Launch and "+" denotes after Launch

MET – Mission Elapse Time (based on Shuttle launch)

GMT- Greenwich Mean Time

Sequence – Number of sequence

Position – Identifies current cadre (POD) and transition cadre (XPOD)

Activity – Section includes descriptions of activity to be performed, start of significant events, and Launch minus and plus days.

5A.1 Cadre – X identifies which cadre performs task

6A Transition Cadre – X identifies which cadre performs task

6A Cadre – X identifies which cadre performs task

Remote Users – X identifies when Remote Users are affected or performs task

FIGURE 5.1-3 TRANSITION TIMELINE CHECKLIST EXAMPLE

This procedure identifies the differences between a stage (each ISS flight –5A.1, 6A, 7A within an increment) transition and an increment transition in each section.

There will be specific transition cadre assigned for the checkout and preparation of the POIC systems prior to the actual transition of the POIC systems from one stage/increment to another. The cadre supporting the current stage will initiate and perform the transition with assistance, if required, from the transition cadre. The cadre supporting at the end of an increment will initiate the transition to the next increment and handover to the next increment cadre.

Stage Transition checkouts are performed by the POIC transition cadre by logging into the transition systems on the consoles in PCA-2, STP-2, and MIC-2. At transition minus 12 hours, the current POIC cadre with two workstations operating from the primary consoles in PCA-1 will release one workstation and have it configured for the next flight. Current POIC cadre with only one workstation, if required, can connect via X-Window to the transition systems in PCA-2, STP-2, and MIC-2 . For each stage transition, only a POIC database change is planned.

Increment Transition is performed by the cadre assigned to the next increment by logging into the transition systems on the consoles in PCA-2, STP-2, and MIC-2. This is for each increment transition that has a POIC database and a software change planned.

Voice coordination for the stage and increment transition systems is performed on designated voice loops (POIC internal transition coordination on POIC Internal- POIC Int and POIC to Remote users transition coordination on Remote PDs - PD Conf).
- Stage Transition: POD supporting the current stage also coordinates the next stage transition.
- Increment Transition: XPOD (transition POD) coordinates the transition activities.

When the cadre completes their support of the present stage or increment, the primary POIC systems supporting PCA-1, STP-1, MIC-1, etc., are released for reconfiguration to the final ISS payload support of the next stage or increment.

Prior to the transition to the next stage/increment, each cadre position is responsible for assuring that:

(a) Files are identified and saved as required on the present stage/increment systems.

(b) The transition stage/increment systems/products/tools have been updated and verified as required.

(c) Procedure updates have been implemented in the required documents.

(d) Accounts/passwords additions and subtractions are validated.

(e) Enhanced HOSC System (EHS) User Data-generated Elements (UDE), i.e., displays, scripts, and computations, have been updated and saved with any changes identified during the present stage/increment support.

(f) Required DataBase Change Requests (DBCR) are submitted during the previous stage/increment and are included in the next stage/increment database.

(g) Files in PIMS from the present stage/increment folder are copied into the next stage/increment folder as required. File to file copy may require an extensive timeframe.

PROCEDURE

A. IST Transition Systems Configuration: Launch -6 to -8 Day Timeframe

Launch -6 days, <u>Stage Transition</u>: Only a database (DB) change is planned; therefore, the IST would require 2 days to configure the transition systems.

Launch -8 days, <u>Increment Transition</u>: A database and software change is planned; therefore, additional time (2 days) is added for the new software installation and checkout.

1. Call to stations for IST only. The POIC cadre's call to stations is at Launch – 4 Days.

2. IST configures and verifies all the transition systems as required for the next stage/increment. Reference:

    (a) SOP 5.10 Command & Telemetry Database Reconfiguration, which is performed on every stage/increment transition.

    (b) Marshall Comm performs SOP 5.9 Keyset Reconfiguration. This is only planned for Increment Transition. Marshall Comm has to change out the keyset labeling on the MLP-2 units.
    (c) SOP 5.11 PPS Reconfiguration. This is only planned for as needed during increment transition.

3. Remote sites operations support team call to stations.

4. Marshall Data verifies that the new remote interfaces are established for the next stage/increment per their console handbook procedures.

5. Marshall Data notifies XPOD on POIC Int loop when the systems are available for the cadre to logon and provide the overall status. (Reference SOP 5.13 POIC System Status.)

B. POIC Internal Cadre Checkout: Launch -4 Day Timeframe

1. POIC transition cadre call to stations.
There are specific transition cadre assigned for checkout and preparation of the POIC systems prior to the actual transition of the POIC systems from one stage/increment to another. The cadre supporting the current stage initiates and performs the transition with assistance, if required, from the transition cadre. The cadre, supporting at the end of an increment, initiates the transition to the next increment and handovers to the next increment cadre. The transition cadre positions are identified with an "X" prior to the name (XPOD, XDMC, etc).

2. Marshall Data informs XPOD on the POIC Int loop that the POIC systems for the next stage/increment transition are configured and ready for the cadre checks.

3. XPOD notifies on the POIC Int loop the transition cadre supporting the transition checkout to logon to the transition systems configured for the next stage/increment and to perform standard and individual position checks per their console handbook procedures and Cadre Ops Verification Procedures Handbook as required.
   - Stage Transition: The POIC transition cadre logons directly to the transition systems in PCA-2.
   - Stage Transition: Only the SOC's primary console in PCA-1 is configured for the next stage.
   - Increment Transition: The transition cadre and/or new increment cadre logons directly to the transition systems in PCA-2.

NOTE: Most of the items in the General section (a) through (g) of this procedure should be completed in previous support activities and real-time changes made to present stage/increment tools. The cadre needs to ensure that the most recent changes have been saved, documented, updated, and validated as required. Individual cadre configuration management of tools is essential.

4. Once the cadre completes their verification of the next stage/increment capabilities on the transition systems, each cadre position notifies XPOD on the POIC Int loop of their status.

5. Once XPOD receives all the required status, XPOD announces on the POIC Int loop the internal checkout is complete and ready to support the next stage/increment checkouts.

C. POIC Internal PIMS Verification: Launch – 4 Day Timeframe

The files in PIMS required for a transition to the next stage or increment should have been copied and validated for the most part in previous support activities. The time

required to copy required files from the present stage/increment folder to the next stage/increment folder could be extensive. At this time, the cadre needs to ensure that the most recent changes have been saved, documented, updated, and validated as required.

Stage Transition: No planned EHS software change that would affect PIMS is scheduled. The cadre performs the file copies into the next stage folder in the existing primary PIMS server as required.

Increment Transition: A planned EHS software update affecting PIMS is scheduled. The cadre, who has to load or copy the files on to the next increment folder which is on a separate single PIMS server, needs to consider the 3-week planning cycle here. The file copy capability and method between the primary PIMS server (present increment) with one software version to another PIMS server (next increment) with a different software version is being developed. When the primary PIMS server has been released from the previous increment support, it then is configured with the next increment's software and files. A PIMS System Manager's level privilege is required to perform the file copy between the two PIMS servers which now have the same software versions. Figure 5.1-2 depicts the Stage and Increment PIMS Transition Flow.

XPOD requests the transition cadre or the next increment cadre to logon to the next stage/increment PIMS session via their mission PC to verify the PIMS operations. The current stage cadre would have to logoff the current session to perform any checks for the next stage.

1. The transition cadre verifies their documents, OCRs, and files are available and their basic functions are checked.

2. The transition cadre contacts RICO in reference to questions with the Document Configuration Management (DCM) changes and archival of completed and submitted/open OCRs within PIMS.

3. Once completed, the transition cadre notifies XPOD on the POIC Int loop that the internal PIMS verification is completed.
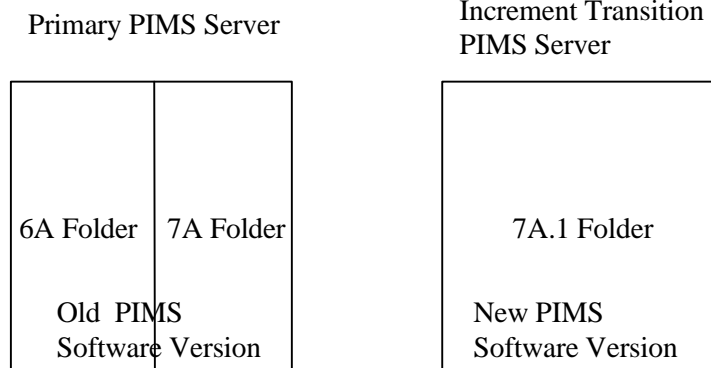
Primary PIMS Server

Stage Transition

5A.1 Folder → 6A Folder

Same PIMS Software version
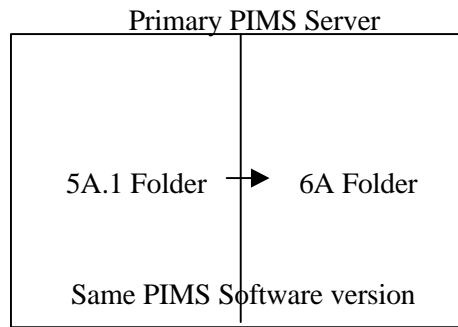
On a stage transition, files are copied within the primary PIMS server.

Increment Transition Step 1

Primary PIMS Server

Increment Transition PIMS Server

6A Folder | 7A Folder

Old PIMS Software Version

7A.1 Folder

New PIMS Software Version

On an increment transition (new PIMS S/W), the previous files must be either loaded or copied to the transition PIMS server with the new PIMS software.

Increment Transition Step 2

Increment Transition PIMS Server

Primary PIMS Server

7A.1 Folder

New PIMS Software

7A.1 Folder | 7A.1 Folder

Now contains the New PIMS Software
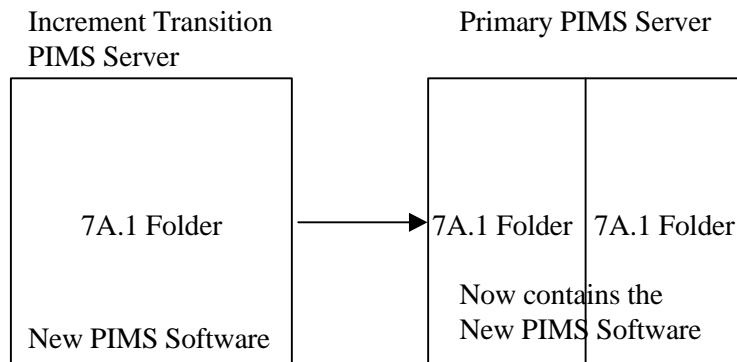
Once the previous increment has released the primary PIMS server (redundant), it is reconfigured with the new PIMS software and now the files that were either loaded or copied in the transition PIMS server must be copied into the primary PIMS server.

FIGURE 5.2-2 STAGE AND INCREMENT PIMS TRANSITION FLOW

D. POIC Internal Command Validation: Launch- 4 Day Timeframe

<u>Stage/Increment Transition</u>: Internal command validations are performed the same.

1. Marshall Data configures and SYSCON enables the command capability on the transition systems of the next stage/increment for the Command Simulator checks.

2. Marshall Data notifies XPOD and XCPO on the POIC Int loop that the systems are ready for validation. (Reference SOP 5.7 for POIC and Remote Sites Command Interface and Verification.)

3. XCPO enables XCPO, XPRO, XDMC, and XPHANTOM for command checks.

4. The cadre sends available commands (including modifiable) for their operations. The cadre confirms, via the Command Track, no errors with their own commands. XCPO monitors, via the Command Track, the cadre command activity in real-time and verifies no errors.

5. XPOD notifies Marshall Data on the POIC Int loop that internal command checks for the next stage/increment are completed.

E. POIC Shuttle OD Telemetry Data Checks: Launch- 48 hour Timeframe

<u>Stage/Increment Transition</u>: Shuttle OD telemetry checks are performed similarly for either case. Only Shuttle OD (STS OD) data is available for checks.

1. XPOD notifies Marshall Data on the POIC Int loop of the SOC readiness to support pre-stage/increment telemetry data checks.

2. Marshall Data configures Shuttle OD with the transition systems for checks and notifies XPOD on the POIC Int loop.

3. XPOD requests SOC on the POIC Int loop to verify available measurements on their displays

4. Once the verification is completed, SOC statuses XPOD on the POIC Int loop.

F. Remote Voice Verification: Launch – 3 Day Timeframe

Remote voice loops are established at the start of the increment for all remote sites within the increment.

Stage Transition: Only the new remote sites coming on in the next stage require voice checks.

Increment Transition: The new remote sites supporting the start of the next increment are verified. This needs to be coordinated with the present stage voice operations.

1. Remote site Users call to stations.

2. POD requests OC to verify the new voice interfaces per voice the loop listing per SOP 1.4.5.X (new SOP per increment) with the remote sites for the next stage/increment.

3. OC verifies the assigned operations and science contact voice loops to each remote site.

4. OC notifies POD on the POD loop that the voice checkout is complete.

5. POD notifies Marshall Comm on the POIC Int loop that the voice checkout is complete.

G. Remote Telemetry Data Flow: Launch –3 Day Timeframe

No remote data interface is performed for current or new Remote Users during the checkout period at L-3 Days. The Remote Science and Payload Health and Status Data was verified during previous CoFR testing.

H. Remote PIMS Verification: Launch – 3 Day Timeframe

The remote PIMS Flight mode for the next stage/increment is available at least 1 month prior to the start of the next stage/increment.

Stage Transition: Only the new remote sites PIMS interfaces coming on the next stage are verified. The current stage remote sites may perform checks if they wish to logoff the current PIMS session.

Increment Transition: All the new remote sites PIMS interfaces supporting the next increment are verified. All sites are required to do verifications due to the planned POIC software deliveries that may affect PIMS operations.

1. On the POD loop, POD requests Remote Users to verify their PIMS capabilities and files in the next stage/increment folder and provide the status to POD.

2. Once all PIMS interfaces are validated, POD notifies Marshall Data on the POIC Int loop.

I. Remote Users Command Verification: Launch – 3 Day Timeframe

The present stage/increment Remote Users that continue into the next stage/increment do not require testing in this timeframe. These Users do not have redundant interfaces just for checkouts. Checkouts, if required, are performed once the present stage/increment operations have terminated and the transition to the next stage/increment has occurred.

Stage Transition: Only the new remote sites command interfaces coming on the next stage are verified.

Increment Transition: All the new remote sites command interfaces supporting the next increment are verified. All sites are required to verify due to the planned POIC software deliveries that may affect command operations.

NOTE: Reference SOP 5.7 for the POIC and Remote Sites Command Interface and Verification procedure.

1. XCPO requests Marshall Data on the POIC Int loop to configure and SYSCON to enable the command capability for remote command checks on the Command Simulator.

2. The cadre ensures each Remote User sends available commands for their operations. The cadre confirms, via the Command Track, no errors with their own commands. XCPO monitors, via the Command Track, the cadre command activity in real-time and verifies no errors.

3. XCPO notifies XPOD on the POIC Int loop when the cadre commanding is complete.

4. Once all confirmed, XCPO provides the status to XPOD and Marshall Data on the POIC Int loop.

J. Transition Stage/Increment Validation Completed: Launch –2 Days

1. Once XPOD receives all required statuses, XPOD announces to all transition cadre on the POIC Int loop the readiness to support the next stage/increment.

K. ETOV Operations Support Starts: Launch – Launch – 2 Days

ETOV Operations that support POH procedures are divided into Transport and Transfer Operations. Transport operations are for ISS payloads going to or returning from the Space Station that are transported via the Shuttle. Transport Operations are identified in 5.2 SOPs. Transfer operations are for the payload transfer phase between the Shuttle or MPLM and ISS. Transfer operations are identified in the 5.3 SOPs.

1. At the start of the ETOV operations, SOC conducts their support on the transition POIC systems using the next stage/increment database. The procedures that may be performed are contained in Table 5.1-I.

L. MCC-H Ground Systems Reconfiguration: Launch –1 Day Timeframe

Prior to the launch of the Space Shuttle for the next stage/increment, MCC-H reconfigures their ground systems. This is coordinated between the MCC-H, POIC, and Remote Users prior to the activity. There is no command interface or Drop Box activity during the 1 hour reconfiguration period.

M. Launch

NOTE: Shuttle S-Band data only available for next Stage/Increment ETOV support.

N. Launch to Docking (L to L+72 Hours)

1. During ETOV Operations on the POIC transition systems for the next stage/increment, procedures are performed per Table 5.1-I.

TABLE 5.1-I POH/JOIP ETOV TRANSPORT OPERATIONS PROCEDURES

POH PROCEDURES
SOP 5.2, ETOV Transport Operations Philosophy
SOP 5.2.1, Commanding to Payloads in the MPLM During ETOV Operations
SOP 5.2.2, ETOV Operations Timeline Changes
SOP 5.5.1, Manual Crew ETOV Procedure
SOP 5.5.2, U.S. SODF ETOV Data Retrieval

O. Deactivation / Transfer / Install : Docking Timeframe
These activities are planned to take place with the current POIC systems and cadre.

The order of execution of the following procedures is dictated by the order of the events established in the OSTP between the stage/increment. Each stage or increment transition is different. This is based on what payloads are on-board the Shuttle and the ISS and the

order payloads are deactivated, de-installed, prepared for transfer, transferred, and installed.

1. Rack and Unpowered Payload: Deactivation and Removal Procedures

Reference SOP 5.4 for Rack and Subrack Deactivation and Removal Procedures.

2. Rack and Unpowered Payload: Transfer/Installation Procedures

    (a) Reference SOP 5.3.3 for Transfer Operations; and SOP 5.4 for Rack and Sub-Rack Installation procedures.

    (b) The POIC cadre continues to use the present stage/increment POIC systems.

3. Powered Payload: Deactivation and Transfer Procedures

    (a) The POIC cadre uses the present stage/increment systems to perform the deactivation, preparation for transfer, transfer, and install operations for powered payloads.

    (b) Reference SOP 5.4 for Deactivation and Installation procedures and SOP 5.3.2 for Transfer Operation procedures.

P. POIC Transition Systems to the next Stage/Increment : Docking + Timeframe

1. Stage Transition: Prior to transition, XPOD requests POD to have the current cadre with 2 workstations in PCA-1, to release 1 workstation to be configured for the next stage. Other positions can X-Window from their PC in PCA-1 into the transition systems in PCA-2.
   Increment Transition: XPOD has the transitions cadre maintain workstations in PCA-2 since they may support activation and checkout there.

2. POD coordinates the planned transition time period with the POIC cadre, MCC-H, and Remote Users.

3. DMC puts MCOR in Record.

4. POD requests CPO on the POD loop to load the next Stage/Increment files from MSD to PLMDM 1&2.

Transition Starts

5. CPO verifies the PLMDM 1&2 Load .

6. CPO announces on the CPO loop that all operators are to logoff the Command Plan Management Tool.

7. CPO disables commanding.

8. POD notifies all cadre on the POD loop to logoff the present Stage/Increment workstations.

9. Only Remote Users transitioning to the next stage/increment, terminate X- Window sessions with current support and logon to next Stage/Increment workstations already established.

10. There is no commanding during the transition period.

11. POD releases the current flight systems to Marshall Data for reconfiguration to the next Stage/Increment.

12. SYSCON releases the current Command Servers and configures the transition Command servers for the next Stage/Increment Support, copies the Command Data sets, and establishes the Mini MOP for the previous Stage/Increment access to NRT data.

13. Marshall Data configures PDSS routing tables and ISS - S and Ku Band data for next the Stage/Increment support.

14. DMC announces on the DMC loop when ISS Data AOS.

15. <u>Stage Transition</u>: Marshall Data notifies POD on the POD loop that all PCA-1 systems are now configured for the next stage. On the POD loop, POD informs all cadre to logon all workstations.

    <u>Increment Transition</u>: IST continues to reconfigure all of the PCA-1 systems with the new software load for the next increment.

16. Marshall Data informs POD on the POD loop when the command systems are configured and the interface established with MCC-H. POD relay status to Cadre.

17. CPO verifies the command capability.

18. On the POD loop, POD notifies all operators to logout of the current PIMS flight mode session and into the next flight mode.

19. Once the POIC primary systems are reconfigured and validated for the next Stage/Increment, POD informs Marshall Data on the POD loop that the transition resources are released.

Q. Next Stage/Increment Payload Activation and Checkout: Docking + Timeframe

These activities are planned to take place with the next Stage/Increment POIC systems and cadre.

The order of execution of the following procedures is dictated by the order of the events established in the OSTP between stage/increments. Each stage or increment transition is different. This is based on the order payloads are activated, and the required ISS on-board equipment and software reconfigurations.

1. Rack and Subrack: Payload Activation and Checkout Procedures

Reference SOP 4.11 for PDSS Routing Reconfiguration; SOP 5.4 for Rack and Subrack Activation and Checkout procedures.

R. MCC-H Ground Systems Reconfiguration: Landing + Timeframe

After the Shuttle has undocked and landed, MCC-H is required to reconfigure their ground systems. This is coordinated between the MCC-H, POIC, and Remote Users prior to the activity. There is no command interface or Drop Box activity during the 1 hour reconfiguration period.